

Claims

1. Device for transporting reels of material (01), wherein the reels of material (01) are arranged on a first transport carriage (27) and this transport carriage (27) is arranged on a second transport carriage (32), wherein the second transport carriage (32) travels between a storage area (11; 22; 24) comprising a plurality of storage spaces (13) and a reel changer (09) in a web-processing machine (06), wherein the second transport carriage (32) travels with the first transport carriage (27) and the reel of material (01) disposed thereon up to an uploading and/or unloading position of the reel changer (09).
2. Device for transporting reels of material (01) from a storage area (11; 22; 24) comprising a plurality of storage spaces (13), wherein the reels of material (01) are arranged in the storage spaces (13), each on a first transport carriage (27), wherein a fixed storage space (13) is assigned to each first transport carriage (27).
3. Device for transporting reels of material (01) from a storage area (11; 22; 24) comprising a plurality of storage spaces (13) to a web-processing machine (06), wherein the web-processing machine (06) has multiple processing stations (07, 08) arranged horizontally one in front of another in a longitudinal direction, and a reel changer (09) is arranged horizontally in front of the processing stations (07, 08), wherein a transport route (14) for a transport carriage (32) is provided in front of the reel changer (09) and in a virtual extension of the longitudinal direction, and a plurality of storage spaces (13) for reels of material (01) are arranged on both sides of this transport route (14).
4. Device for transporting reels of material (01) from a storage area (11; 22; 24) comprising a plurality of storage spaces (13) to a web-processing machine (06), wherein the web-processing machine (06) has multiple processing stations (07) arranged horizontally, one in front of another in a longitudinal direction, and a reel changer (09) is arranged horizontally in front of the processing stations (07, 08), wherein the storage spaces (13) are arranged parallel to the longitudinal direction and parallel to the processing stations (07).
5. Device according to claim 4, characterized in that the reels of material (01) are removed from the storage spaces (13) from a side that faces away from the processing machine (06).
6. Device according to claim 4 or 5, characterized in that the storage spaces (13) are arranged between the processing machine (06) and a transport route (12) for a transport

- carriage (32), which extends parallel to the longitudinal direction of the processing machine (06), for the purpose of removing the reels of material (01).
7. Device according to claim 4 or 5, characterized in that no transport route for a transport carriage (27; 32) is arranged between the processing station (07, 08) and the storage spaces (13).
 8. Device according to claim 1, 2, 3 or 4, characterized in that the reels of material (01) are stored in the storage spaces (13) on first transport carriages (27).
 9. Device according to claim 2, 3, 4 or 6, characterized in that each second transport carriage (32) is arranged such that it transports a first transport carriage (27).
 10. Device according to claim 1, 2, 3 or 4, characterized in that, based upon the direction of travel of the reels of material (01), the storage spaces (13) is arranged downstream from a preparation station (03) for the manual or automated application of splice elements.
 11. Device according to 1, 2, 4 or 6 characterized in that a plurality of storage spaces (13) for reels of material (01) are arranged on both sides of the transport route (12).
 12. Device according to claim 1, 2, 3 or 4, characterized in that the storage area (11; 22; 24) is designed in the manner of an intermediate storage area, especially in the manner of a daily storage area.
 13. Device according to claim 1, 2, 3 or 4, characterized in that at least two reels of material (01) that have already been unpacked and prepared with splices (15) for the reel change are held in the storage spaces (13) of the storage area (11; 22; 24).
 14. Device according to claim 13, characterized in that all new reels of material (01) are prepared with splices (15).
 15. Device according to claim 3 or 4, characterized in that a first transport carriage (27) is arranged in each storage space (13) at least for a time.
 16. Device according to claim 1 or 15, characterized in that the first transport carriages (27) can be placed in any of the storage spaces (13) of the storage area (11; 22; 24).

17. Device according to claim 1, 2, 8 or 15, characterized in that at least one first transport carriage (27) can also be moved along a transport route (19) into an unpacking station (03) for unpacking the reels of material (01).
18. Device according to claim 17, characterized in that at least one first transport carriage (27) can also be moved along a transport route (19) into a splice preparation station (03) for preparing the splices (15) on the reel of material (01).
19. Device according to claim 18, characterized in that the splice preparation station (03) can simultaneously be used as an unpacking station (03).
20. Device according to claim 1, characterized in that, in a virtual extension of the direction of web travel in the web-processing machine (06), a transport route (12) is provided in the storage area (11), along which the second transport carriage (32) can be moved.
21. Device according to claim 1, characterized in that, parallel to the extension of the direction of web travel in the web-processing machine (06), a transport route (12) is provided in the storage area (11) along which the second transport carriage (32) can be moved.
22. Device according to claim 2, characterized in that the reels of material (01) or the first transport carriages (27) can be removed from the storage spaces (13) from a side that faces away from the web-processing machine (06).
23. Device according to claim 1, 2 or 4, characterized in that the storage spaces (13) can be approached via branch lines (16) that extend especially perpendicular to the transport route (11).
24. Device according to claim 1, 2 or 4, characterized in that storage spaces (13) are provided on only one side of a transport route (12).
25. Device according to claim 1 or 9, characterized in that a position-sensing system is provided along at least certain segments of a transport route (12) for the precise positioning of the second transport carriage (32).
26. Device according to claim 1, 2, 3 or 4, characterized in that the storage area (11; 22; 24) is secured against unauthorized entry by means of a secured area (17; 37) installed along the perimeter of the storage area (11; 22; 24).

27. Device according to claim 26, characterized in that the secured area (17) of the storage area (11, 24) is formed in sections by a perimeter fence.
28. Device according to claim 26 or 27, characterized in that the secured area (17) of the storage area (11) is formed in sections by the area security system (37) of the reel changer (09).
29. Device according to one of claims 26, 27 or 28, characterized in that at least one transfer channel (18) is provided in the area security system (37) to allow reels of material (01) to be transferred in and/or out.
30. Device according to one of claims 29, characterized in that the storage area (11) is secured against unauthorized entry in the area of the transfer channel (18) by photoelectric beams or ultrasound sensors.
31. Device according to claim 30, characterized in that multiple photoelectric beams or ultrasound sensors are provided, which are arranged at different levels.
32. Device according to one of claims 1 through 31, characterized in that multiple processing stations (07) are provided in the web-processing machine (06), one in front of another in a longitudinal direction.
33. Device according to one of claims 1 through 32, characterized in that in the web-processing machine (06) at least one processing station (07) is designed as a printing couple (07) in a rotary printing press (06).
34. Device according to claim 33, characterized in that with the printing couples (07) the rotary printing press (06) has a horizontal web path.
35. Device according to one of claims 1, 2 or 3, characterized in that the storage area (11; 22; 24) is designed as a FIFO storage area.
36. Device according to claim 1, 2 or 3, characterized in that a control center is provided for operation of the web-processing machine, and the storage area (11; 22; 24) is arranged adjacent to the control center.
37. Device according to claim 1, 2, 3 or 4, characterized in that the first transport carriage (27) has runners (28) and travels on rails.

38. Device according to claim 1, 2, 3 or 4, characterized in that the second transport carriage (32) has runners (34) and travels on rails.
39. Device according to claim 38, characterized in that a support frame of the second transport carriage (32) has a short segment of track (33), in which the first transport carriage (27) runs.
40. Device according to claim 37 or 38, characterized in that the actuation of the transport carriage (27; 32) is accomplished via chain drives.
41. Device according to claim 39, characterized in that the second transport carriage (32) has two segments of track (33; 33') arranged at a distance (a) from one another.
42. Device according to claim 41, characterized in that the distance (a) between the two segments of track (33; 33') is greater than a maximum diameter (D_{\max}) of a reel of material (01) to be transported.
43. Device according to claim 1, 2, 3 or 4, characterized in that at least some of the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate a single transport carriage (27).
44. Device according to claim 1, 2, 3 or 4, characterized in that the majority of the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate a single transport carriage (27).
45. Device according to claim 1, 2, 3 or 4, characterized in that all the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate a single transport carriage (27).
46. Device according to claim 43, characterized in that at least some of the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate two transport carriages (27).
47. Device according to claim 44, characterized in that the majority of the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate two transport carriages (27).

48. Device according to claim 45, characterized in that all the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate two transport carriages (27).
49. Device according to claim 46, characterized in that at least some of the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate more than two transport carriages (27).
50. Device according to claim 47, characterized in that the majority of the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate more than two transport carriages (27).
51. Device according to claim 48, characterized in that all the storage spaces (13) and/or the branch lines (16) allocated to the storage spaces (13) accommodate more than two transport carriages (27).
52. Device according to claim 1, 2, 8 or 15, characterized in that at least one transport carriage (27) carries an adapter designed to accommodate a partial reel.
53. Device according to claim 1, 3 or 9, characterized in that two storage areas (11; 11') are arranged, each with a second transport carriage (32).
54. Device according to claim 53, characterized in that the transport routes (14) for the two transport carriages (32) are arranged extending parallel to one another.
55. Device according to claim 53, characterized in that the two storage areas (11; 11') are connected to one another via a track.
56. Device according to claim 53, characterized in that a splice preparation station (03) is arranged between the two storage areas (11; 11').
57. Device according to claim 1, 3, 9, 10 or 53, characterized in that the second transport carriage (32) is arranged to transport the splice-prepared reels of material (01) into the storage area (11; 11').
58. Device according to claim 1, 2, 3 or 4, characterized in that at least two storage spaces (13), and/or branch lines (16) allocated to said storage spaces (13), arranged directly one in front of another in the longitudinal direction of the web-processing machine (06), have a

spacing (a) that is greater than a maximum diameter (D_{\max}) of the reel of material (01) to be transported.

59. Device according to claim 1, 2, 3 or 4, characterized in that at least two storage spaces (13), and/or branch lines (16) allocated to said storage spaces (13), arranged directly one in front of another in the longitudinal direction of the web-processing machine (06), have a spacing (a) that is dimensioned such that two new reels of material (01) can be or are stored.
60. Device according to claim 1, 2, 3 or 4, characterized in that the majority of storage spaces (13), and/or branch lines (16) allocated to said storage spaces (13), arranged directly one in front of another in the longitudinal direction of the web-processing machine, have a spacing (a) that is greater than a maximum diameter (D_{\max}) of the reel of material (01) to be transported.
61. Device according to claim 1, 2, 3 or 4, characterized in that the majority of storage spaces (13), and/or branch lines (16) allocated to said storage spaces (13), arranged directly one in front of another in the longitudinal direction of the web-processing machine (06), have a spacing (a) that is dimensioned such that two new reels of material (01) can be or are stored.
62. Device according to claim 1, 2, 3 or 4, characterized in that all the storage spaces (13), and/or branch lines (16) allocated to said storage spaces (13), arranged directly one in front of another in the longitudinal direction of the web-processing machine (06), have a spacing (a) that is greater than a maximum diameter (D_{\max}) of the reel of material (01) to be transported.

63. Device according to claim 1, 2, 3 or 4, characterized in that all the storage spaces (13), and/or branch lines (16) allocated to said storage spaces (13), arranged directly one in front of another in the longitudinal direction of the web-processing machine (06), have a spacing (a) that is dimensioned such that two new reels of material (01) can be or are stored.
64. Device according to claim 2 or 11, characterized in that at least three storage spaces (13) for reels of material (01) are arranged on each side of the transport route (12).
65. Device according to claim 1, 2, 3 or 4, characterized in that new reels of material (01) can be or are stored in at least two storage spaces (13) that are arranged directly one in front of another in the longitudinal direction of the web-processing machine (06).
66. Device according to claim 1, 2, 3 or 4, characterized in that new reels of material (01) can be or are stored in the majority of storage spaces (13) that are arranged directly one in front of another in the longitudinal direction of the web-processing machine (06).
67. Device according to claim 1, 2, 3 or 4, characterized in that new reels of material (01) can be or are stored in all the storage spaces (13) that are arranged directly one in front of another in the longitudinal direction of the web-processing machine (06).
68. Device according to claim 1, 2, 3 or 4, characterized in that reels of material (01) having a maximum diameter (D_{\max}) can be stored in at least two storage spaces (13) that are arranged directly one in front of another in the longitudinal direction of the web-processing machine (06).
69. Device according to claim 1, 2, 3 or 4, characterized in that reels of material (01) having a maximum diameter (D_{\max}) can be stored in the majority of storage spaces (13) that are arranged directly one in front of another in the longitudinal direction of the web-processing machine (06).
70. Device according to claim 1, 2, 3 or 4, characterized in that reels of material (01) having a maximum diameter (D_{\max}) can be stored in all the storage spaces (13) that are arranged directly one in front of another in the longitudinal direction of the web-processing machine (06).
71. Device according to claim 59, 61, 63 or 65 through 67, characterized in that the new reels of material (01) are provided with splices (15).

72. Device according to claim 3, 4 or 32, characterized in that the longitudinal direction and the direction of web travel in the web-processing machine (06) extend essentially in the same direction.
73. Device according to claim 1, 3 or 4, characterized in that no rotating platform for the transport carriages (27) is arranged between the storage spaces (13) and the reel changer (09).
74. Device according to claim 10, characterized in that no rotating platform for the transport carriages (27) is arranged between the storage spaces (13) and the splice preparation station (03).
75. Device according to claim 33, characterized in that at least one printing couple (07), the reel changer (09) and the storage spaces (13) are arranged nearly in a single common plane (20).
76. Device according to claim 75, characterized in that all printing couples (07) are arranged in a single common plane (20).
77. Device according to claim 1, 3 or 4, characterized in that the web-processing machine (06) has a single reel changer (09).
78. Device according to claim 1, 9 or 10, characterized in that the transport route (12) for the second transport carriage (32) and the longitudinal axis (10) of a dryer (08) in the web-processing machine (06) are in alignment with one another.
79. Device according to claim 1, 9 or 10, characterized in that the transport route (12) for the second transport carriage (32) and the longitudinal axis (10) of a dryer in the web-processing machine (06) are arranged offset from and parallel to one another.
80. Device according to claim 1, 2, 3 or 4, characterized in that for the majority of storage spaces (13), each storage space (13) has its own drive for transporting the reels of material (01).
81. Device according to claim 1, 2, 3 or 8, characterized in that for the majority of storage spaces (13), each storage space (13) is equipped with a separate under-floor conveyance system for the transport carriage (27).

- 82. Device according to claim 81, characterized in that the under-floor conveyance system has a continuous mode of propulsion.
- 83. Device according to claim 82, characterized in that the mode of propulsion is designed as a chain.
- 84. Device according to claim 1, 2, 3 or 8 characterized in that each first transport carriage (27) is equipped with its own drive.
- 85. Device according to claim 80, characterized in that each storage space (13) is equipped with its own drive.
- 86. Device according to claim 81, characterized in that each storage space (13) is equipped with its own under-floor conveyance system.
- 87. Device according to claim 1, 3 or 9, characterized in that the second transport carriage (32) is equipped with its own drive.
- 88. Device according to claim 87, characterized in that the drive of the second transport carriage (32) can be actuated independently of the drives of the first transport carriages (27).